Owner's Manual

MAVIS BEACON TEACHES TYPING®

VERSION 4

MAVIS BEACON TEACHES TYPING®

Owner's Manual

"There came a moment when I realized that I was typing–without thinking that I was typing! From that instant on, my creativity soared like a condor, unchained from the burden of scratching, parrot-like, upon my papers."

Mavis Beacon Teaches Typing Version 4 is licensed for use only in accordance with the accompanying license agreement. No part of this manual may be reproduced in any manner whatsoever, without the written permission of Mindscape, Inc. Except as specifically provided in the license agreement, you may not reproduce the software without the written permission of Mindscape, Inc.

Copyright © 1987-1995 Mindscape, Inc. All rights reserved. Mavis Beacon Teaches Typing and Mindscape are registered trademarks of Mindscape, Inc.

Contents

1. The Theory Behind Mavis 1
Our programmers are bursting with pride over Mavis. They asked to tell you why. So here, in their own words, is how Mavis "thinks".

2. Typing Fundamentals 6
A few pointers before you begin your work with Mavis.

3. Keyboard Basics: A Review 11
A quick look at the keyboard. If you already know a little about typing, you may want to skip this section.

4. The Speed-Typing Alternative 13
The story behind the only successful alternative to the standard QWERTY keyboard, and perhaps the way of the future.

5. Typing Errors 17
An explanation of nineteen specific error categories used by Mavis Beacon to analyze your typing progress.

6. Typing Business Letters 20
Some uses for the skills you'll learn with Mavis.

7. A History of Typewriting 32
Probably much more than you ever wanted to know about the fascinating people and machinery that pioneered the amazing hardware and software you'll now be using. Read it. It's fun!

8. Bibliography 51

The Theory Behind Mavis

Mavis Beacon Teaches Typing is the finest typing program in the world. It has elaborate graphics and sound, interesting and varied texts on which to practice, and an astounding number of features, all packaged in an easy and fun-to-use program.

This program is more than merely a bunch of great graphics and fabulous features. At its core is an expert system specifically designed to teach typing. This section explains how this artificial intelligence works. It is not necessary for you to understand how the program "thinks" to use it, but when Mavis begins to make her suggestions, you may find it interesting to know how she comes up with them.

Typing seems like it should be easy. All you have to do is make your fingers hit the keys. Nothing could be simpler, right? In fact, typing is a complex skill bringing together motor and cognitive functions that often have a difficult time cooperating. The best typing teachers know this, and they will note when their students begin to show the characteristic error patterns or substantial speed increases or decreases that signal the need for a new set of lessons. *Mavis Beacon Teaches Typing* does the same thing. The trick, of course, lies in incorporating this human knowledge into a computer program. Here, in rough outline, is how it works.

Script Files

When Mavis first meets a user and until she has enough typing and other response data to start making intelligent analyses and recommendations, both her recommendations and her lesson generation are driven from prestored data. Like a computer chess program in the early going, the program plays from the "book." Rather than introduce special-case algorithms, we just store some precomputed responses. After Mavis has had a chance to analyze a short representative sample of your typing, she will begin to prepare tailored lessons.

The first thing Mavis does is analyze the results of previous lessons for speed and accuracy per key. Then Mavis determines which keys to drill using a special formula to determine key "hot spots." This calculation examines all keys, giving extra weight to those keys that occurred in the current lesson, proportional weight to characters as they occur in common English usage, and an inverse weight based on the frequency of use in the lessons Mavis has so far prepared for the user. This complex calculation is done because:

1. Mavis wants to emphasize keys the student has worked with this lesson. Mavis always has a goal in mind at the beginning of a session. This goal is related to the historical progress of the student, with the by-product being (since there is no current session data) starting lessons focusing on certain keys and patterns. By emphasizing the current session, these keys are emphasized for the remainder of the session and the typist recognizes that they are working toward a goal.
2. Mavis cares about the keys in proportion to their frequency in common English usage. If a typist types the letter Z half as fast as the letter S, but S occurs three times more frequently than Z, the letter S needs the most work, not Z. Historically, other typing programs ignore this simple fact and quiz letters out of proportion to their importance in actual daily typing tasks.
3. However, Mavis does want to make sure that all keys are covered. So, she keeps track of all the keys she has included in her lessons, builds a frequency table, and biases the choice in favor of keys that haven't been practiced much.

These three criteria are in fact contradictory (as often happens when humans need to make decisions), but the rules used mediate among them and everything ultimately balances out. Only a computer can handle these calculations in reasonable time, because they require fancy record keeping and the ability to monitor split-second differences in keystroke interval times for all keys typed.

The Analysis Phase

After Mavis has determined the keys on which she is going to focus, she tries to determine how to build lessons to correct the problem. To do this, she first analyzes the results of the lesson for many kinds of errors and statistics such as speed and accuracy per key, number of keys needed before catching an error and backing up, the transition rate to and from a given key, dropped keys, doubled keys, transpositions, a hit that is in the right row but with the wrong finger or in the right column on the wrong key, overlapping errors (typing between two keys instead of on one), mirror image (correct row and column but wrong hand), shift key problems, or any other kind of consistent mis-hitting problem. There are about thirty categories to begin with. The program also has the ability to generate entirely new categories, using its sophisticated pattern recognition capabilities. Each of these statistics is maintained for each key.

Next, the program groups the results into several compositional categories according to the statistic's relation to any finger, row, column, hand, or key type. These results update the historical information Mavis tracks for each student, for each lesson, session, and all lessons combined.

Hot Keys

After the basic analysis is complete. Mavis scans to locate letters with the highest "hot key" rating. She identifies extremely faulty keys using a standard statistical analysis that rates the importance of any key by its overall contribution to the speed/error matrix.

Next Mavis totals across the rows for keystroking errors in those columns that match her selected "hot keys." These totals are adjusted by the frequency the category has been used as a contributing factor in determining previous lessons and by a preference weighting based on our research into the causes, and importance, of each kind of error. Then the totals are compared to determine if there are any obvious error types. If there is a standout, it is set aside. There may not be any obvious error patterns, in which case an alternate lesson construction method is used.

Compositional Errors

If there are no statistically significant error types, Mavis looks for "descriptive" errors. She looks to see if errors can be categorized by finger, row, hand, or character type (punctuation, numerics, alphas, and so on). If there are statistically significant variances detected for these categories, lessons will be built to match. If Mavis still cannot locate any particular category, she creates a "no category" lesson.

Other Justifications for a Lesson

In addition to this two-phase analysis, there are other factors that affect lesson choice. Mavis Beacon tries hard to avoid repetition. She is always against doing a primary lesson type at too closely spaced an interval. If the factors weighing in favor of repeating a lesson type are very strong, Mavis will probably still not allow it to repeat and instead predict that unless the typist shapes up, he or she will probably see this lesson again soon. Mavis is also concerned about the frustration factor. Sometimes the user gives up (escapes out of the lesson only partway through), fidgets (pauses a lot to change settings or does not accept the offered lesson), or just gets upset (Mavis sees lots of keystrokes coming through very fast, none of which is correct). At such points, Mavis may suggest playing a game, revising the target speed goal, or even calling it a day. Mavis also keeps account of the ratio of drills to games and whether the user continually requests a game. If so, she adjusts the ratio to match, just as a good human teacher would.

Lesson Templates

Each error type has one or more associated general lesson "templates" which are lists of rules specifying an appropriate response in general terms. This pattern of lesson options may be moderated by outside factors. For instance, a lesson pattern may call for lessons built of phrases; for a child, the phrases we will use are jokes and riddles, whereas for an adult we might choose material from a Penguin or Puffin classic such as, The Last of the Mohicans or The Adventures of Tom Sawyer.

Each template also has a list of Mavis lesson descriptions associated with it. These descriptions essentially provide the words Mavis uses to rationalize her lesson choices.

The Stuff of a Lesson

The components Mavis has at her disposal to create a lesson are huge. Mavis can prepare lessons from her extensive database of words. When she does this, she can focus on words containing certain characters or certain patterns, or both. Alternatively, Mavis can draw from her database of interesting sayings, facts, riddles, and jokes. Additionally, she can access many prepared lessons to test special skills like 10-key typing, business correspondence, and so forth. Lessons using the five hundred most common words in English can be created. Left hand, right hand, and "typing hurdles" lessons can also be generated.

Furthermore, Mavis can take any one of these lessons and vary it greatly by changing its format. For instance, so long as the user hasn't requested otherwise, she might change any of the screen features, such as the clock, cursor, moving hands, and LED's. Mavis can allow users to make multiple errors per key or force them on after the letters are displayed in alternative colors. She can offer "speed" and "accuracy" lessons in which accuracy or speed (respectively) of the typing is not recorded as part of the user's permanent record. She can vary the length of the lesson.

Building the Lesson

After choosing the lesson type and format, Mavis' next job is to create the actual lesson. As discussed earlier, each error type has an associated set of remedies and each remedy has a set of responses. Mavis chooses a "least recently used" remedy selection and prepares the lesson from the information contained there. Depending on the typing situation, Mavis might either read in a completely prepared lesson and present it in the appropriate way, create a lesson based on the phrase database at her disposal, or create a lesson based on words and common letter patterns.

Explain the Choice

Mavis is also required to explain her approach. Associated with each typing situation is a "file" of phrases. There are similar files of phrases associated with other attributes that can make their way into a lesson (such as a prediction). Mavis chooses a phrase from each of these files, splices phrases together following certain rules of English, and prints the result on the Whiteboard.

Typing Fundamentals

> "Like a musical instrument, the typewriter is passive,
> and until played upon by the human hand it is useless."
>
> *William Allen Gilbert (1930)*

When you sit at a computer keyboard, a world of possibilities lies before you. You can create anything you need–a letter, a report, a record of some random thoughts. All it takes is a little practice and you'll never have to worry about tedious handwriting again!

Mavis Beacon Teaches Typing makes learning easy. For beginners, Mavis starts with the very basics of typewriting. You'll learn the arrangement of the keyboard and how to use the correct finger for each key. Once you've mastered these fundamentals, Mavis will analyze your progress. From that point on, you'll get fully personalized tutorials.

From the moment you begin your first lesson, Mavis begins to compile information about your progress, designing the course to meet your individual needs. It is important, therefore that when you start lessons (at your selected level–Beginner, Intermediate, or Advanced) you follow Mavis' recommendations.

Take each lesson as it's presented. Once you've completed a lesson and are comfortable with what you've been taught, feel free to adjust the program settings, turn any lesson into a video game, or pause for an updated graph of your progress. Get familiar with the program. You'll be surprised at the number of things Mavis can do. If you ever get stuck or need instant information, online help is only a keystroke away.

Levels of Instruction

If you have never typed before, or know nothing of the touch typing method, you are a beginner. The Beginner level introduces you to all of the alphabet keys, emphasizing accuracy in those keys; throughout the Beginner lessons, speed is ignored entirely. If you can type a little, but not faster than about twenty words per minute (WPM), you should still select the Beginner category. The Beginner level will increase your speed through accuracy training and prepare you for the next step.

Knowledge of and proficiency with all of the alphabet keys puts you in the Intermediate category. Here, Mavis will review keyboard fundamentals and give you some practice text to type. Next, she will begin introducing the number and symbol keys. Once you've learned them, it's time to work on improving your typing speed and refining your new skills. At this point, Mavis will begin to analyze your typing and suggest lessons to help you improve, all the way through the Advanced category.

If you consider yourself an advanced typist, the Advanced lessons will get your fingers warmed up and then let you try typing some advanced text. Mavis will analyze your typing and construct lessons that address your weaknesses and reinforce your strengths. At this level, you can perfect your speed and accuracy to the nth degree—the sky's the limit, and Mavis will be with you every step of the way.

Keyboard, Chair, and Monitor

In the workplace, many companies have health and safety regulations aimed at preventing repetitive stress injuries. In addition, some legal jurisdictions have enacted laws specifying standards for office equipment for workers who are at risk for repetitive stress injuries. If you work for a company that has such regulations, familiarize yourself with them and follow them.

Following are some general guidelines on how to arrange your work environment to avoid repetitive stress injuries. Adjust the height of your monitor, the height of your chair seat, and the height of your keyboard so that the top of your head is approximately level with the top of the monitor and your elbows are bent at a 90° angle.

If you're going to be seated in front of your computer for any amount of time, good posture is essential. Your keyboard should be level with your elbows—you shouldn't have to reach up or down to touch the keys. Your chair should be comfortable but firm. A chair that's designed specifically for typing comfort or computer use can be a worthwhile investment.

If you use a copystand to hold the material you are typing, adjust the copystand so that it is level with the monitor. When you must look at a copystand for long periods, relax your eyes by occasionally looking away from the screen and focusing on some distant object.

Correct Typing Posture

Sit back in your chair with your feet firmly on the floor or on a foot support, 12 inches or so apart, your upper arms almost vertical, elbows hanging freely and bent at a 90° angle when extended to the keyboard. The keyboard should be squarely in front of your body, within easy reach. Keep your back straight and let your arms relax from the shoulders. Any strained or awkward positions can cause tension in your neck, shoulders, and arms.

Lower back support is extremely important, and properly adjusted armrests on your chair can be very helpful also. The more time you spend working at the computer, the more important it becomes to pay attention to the layout of your computer area.

Hand Position

Keep your hands and wrists straight when you use the keyboard (you might find a wrist support helpful for this). Extend your hands to the keyboard, and let your fingers lightly touch the second row of keys above the space bar. This row of keys is called the home row, and you'll begin and end all your typing strokes from this position. Your fingers should curl naturally over the keyboard, and your right thumb should touch the space bar lightly.

Typing the Keys

Stroke the keys and the space bar with your fingertips, using the weight of your fingers only, not the force of your wrists and arms. An electronic keyboard needs no more than a touch. When you type, pretend that the keys on the keyboard are "red-hot," that your fingers will be burned if you don't touch the keys lightly and briefly. Do not, however, let your fingers bounce on the keys. Keep your hands relaxed and in their neutral position. Stroke the keys lightly and firmly. Let your fingers move easily, not hastily. Take regular breaks when you type for long periods. Get up and stretch or do stretching exercises in your chair. Relax your hands by stretching, rotating them at the wrist, or shaking them loosely to relieve tension.

The Backspace Key

In the days when all typing was printed directly onto the paper, the Backspace key was used more to align the typewriter keys with the paper than anything else. Mistakes were corrected after the document was completed.

Today, modern word processors allow you to use the Backspace key to back up, erase, and then correct errors as you type. Mavis considers this key useful, but its use should not compromise your typing goal. At the Beginning level, Mavis turns the Backspace key off, because a perfect typist never makes mistakes! She'd like nothing better than for you to learn to type quickly and accurately and not use the Backspace key at all! However, most of us do make mistakes from time to time and the Backspace key can be useful.

Mavis allows you to practice with or without the Backspace key. Some lessons are designed to work without the Backspace key, especially the games, so Backspace will automatically turn off at times. Working without the Backspace key is great practice for those times when you'll be working on a typewriter that doesn't allow backspace correction. Remember, if you do choose to work with the Backspace key on, your goal is to type so well that you never need to backspace. It is a convenience, but think how much more convenient it would be if you didn't have any typing errors to correct!

The Enter/Return Key

Most modern word processors have a "word wrap" feature that automatically advances lines as you type. Because of this, you'll never have to use the Enter/Return key when taking a lesson from Mavis unless you have selected the Enter/Return key option. At those times, the symbol (↵) indicates that an Enter/Return keystroke is required.

Practice Time

Studies have shown that typing is learned more efficiently if you practice for about one hour a day; not more, not less. Learning to type is more like learning a sport than learning an academic subject such as math or economics. Typing has more to do with your muscles than with your mind. Set aside a daily practice time and stick to it. You'll find that Mavis never gives you endless boring drills, so your practice will be fun. But don't over-practice. You won't learn any faster if you spend eight hours in front of your keyboard and video screen. Take your time—about one hour of it, once a day.

Increasing Your Typing Speed

Notice that some keys are easier to type than others. You will find that some of your fingers type more naturally than others. The secret of typing speedily lies in the flexibility and control of each finger. This includes how fast each of your fingers types a key and how fast it returns to its home row position. Typing fast is easier than typing each key correctly, but real speed can come only after your have learned accuracy.

The principle is this: Increase your speed to a higher level only after you have gained complete control at a lower level. You can measure your typing ability, as Mavis does, by the number of errors you make. If you make many errors, you're typing faster than your ability to control your keystrokes. Your first goal should be to type at about one keystroke per second. This means typing at a speed of about twelve WPM. Once you are able to type at this speed, increase your speed to fifteen WPM, or let Mavis challenge you. You might make a few more mistakes, but gradually your mistakes will decrease, and you'll be typing at a higher rate. You and Mavis will continue this procedure until you can type at the speed you wish, and Mavis will make specific suggestions for your improvement along the way.

Keyboard Basics: A Review

For a complete tour of the keyboard and to learn which fingers type which keys, just ask Mavis for Keys and Fingers. This section of the manual will introduce you to some of the basics you'll be learning.

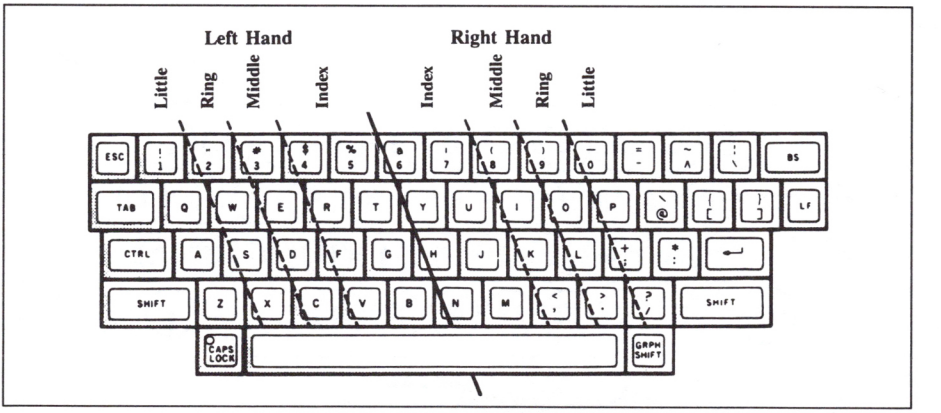
With *Mavis Beacon Teaches Typing*, you'll master the touch typing method, which uses the home row as your home base.

Mavis will have you use the third row from the top as the home row. This is where your fingers start, end, and return between keystrokes. Starting with the little finger of your left hand, your fingers will rest on the A, S, D, F , J, K, L, and ; keys. Mavis will teach you how your fingers can reach to cover the entire keyboard.

Touch typing means typing without looking at the keyboard, relying instead on the "touch" of the keyboard and your familiarity with it to help you type accurately. Mastering this "kinesthetic" sense of finger placement will help you increase speed as well as save energy. Instead of having constantly to look up and down, first at the words you're typing, then at the keyboard, you can keep your eyes on your work and improve your speed.

The illustration below is a keyboard that looks like the one on which you will be learning. Notice how there are lines separating the keys from each other. Between the lines you will see the keys which each finger controls. For example, the left index finger strikes the F,G,R,T,V,B,4 and 5 keys. These keys are sectioned off together.

The standard QWERTY keyboard



The keys labeled with letters of the alphabet normally type a lowercase letter when struck. To get an uppercase letter, you must hold down a shift key when you strike the letter key. The correct technique is to hold down the shift key nearest the little finger of your other hand. For example, if you want to type an uppercase F, you should strike the F key with your left index finger, while holding down the right shift key with the little finger of your right hand.

You'll also learn how to use the Backspace, Return (on the Macintosh) Enter (for IBM or compatible), and Tab keys. These are controlled by the fingers designated on the previous page.

Now that you've read about the basics, you're even more prepared to begin learning with Mavis!

The Speed-typing Alternative

The Dvorak Keyboard

If you were in a rush to get somewhere, would you dash to your car, rev up the engine, and step on the brake? If you wanted to look really sharp, would you dress in the dark? If you had a letter to write, would you tie your hands behind your back? As ridiculous as all of that sounds, it's no more ridiculous than typing on a typewriter keyboard that was designed to slow you down!

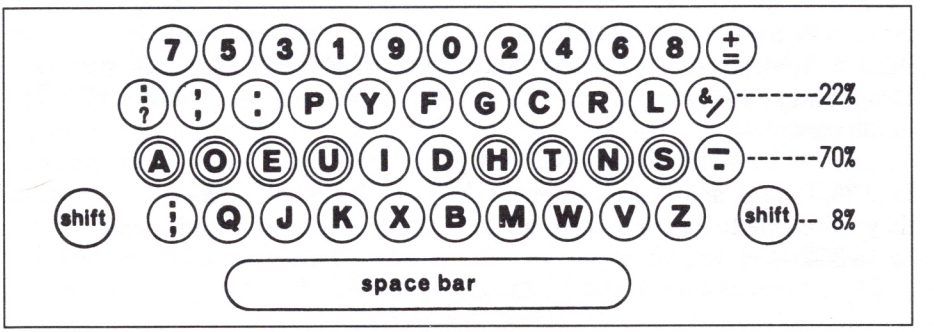
People type to save time. Yet the QWERTY keyboard that most of us use today was planned to hold us back.

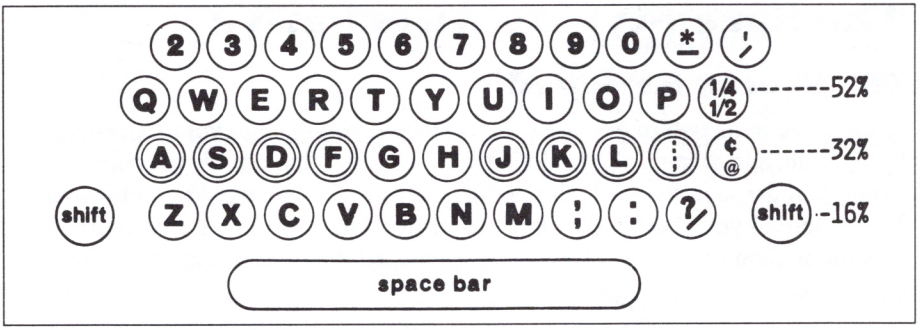
In 1872, Christopher Latham Sholes and his coinventors created the first popular American typewriter. Sholes was generally pleased with his machine but ran into one significant problem. No matter how hard he and his engineers tried, they couldn't type at any acceptable speed without the typewriter keys jamming.

Since the machine couldn't be altered to accommodate the typist, Sholes decided to slow the typist down to accommodate the machine. Therefore, the inventor spent many hours devising the most awkward, inconvenient arrangement of the typewriter keys possible. Finally, Sholes settled on what he called his QWERTY keyboard (named for the first six letters on the typewriter's second row). The name was also chosen as an advertising stunt to remind people that the word typewriter could be typed without leaving this row. With the QWERTY keyboard, Sholes felt sure that even the fastest typist would be slowed sufficiently to use his typewriter.

Today we work on fast-paced computers with capabilities never dreamed of

The Speed-Typing Alternative





Sholes keyboard (1872)

by Sholes and his friends. Yet we still use a keyboard that he designed over a century ago to correct faulty machinery that no longer exists.

Of the several attempts made at changing the typewriter's key arrangement, only one had any impact on the evolution of typewriter design. It was the work of efficiency expert, August Dvorak, and a former college professor, William L. Dealey.

Like Sholes, Dvorak and his colleague also studied the English language, but not for common letter patterns to separate and thus slow the typist down. Dvorak and Dealey examined the English language with the express purpose of determining the optimal placement of letters on the keyboard.

Through their work, Dvorak and Dealey succeeded in pinpointing the major errors in the QWERTY keyboard. They found that the QWERTY keyboard forced the typist to move his or her fingers in awkward patterns to construct even the simplest words. Further, they found that the typist's weaker fingers (and the generally weaker left hand) were given the majority of the work, while stronger fingers and the stronger right hand had an easier time of it. The Dvorak and Dealey design fixed all that.

Because of their work, the Dvorak keyboard allows 70% of all typing tasks to be performed without lifting the fingers up or down from the third or "home row." As a result, almost 3,000 words can be typed on the Dvorak home row, but a mere 120 can be constructed from the QWERTY home base.

In 1936, Dvorak and Dealey patented the Dvorak keyboard. With it, they were able to increase accuracy in typing by almost 50% and speed by 15-20%!

Additionally, the Dvorak arrangement reduces the amount of effort needed to complete large typing projects. Studies show that in an average eight-hour day, a typist's fingers travel about sixteen miles on a QWERTY keyboard. In the same day, a Dvorak typist's fingers travel about one mile. Furthermore, average learning time on the Dvorak has been found to be around 20 hours, less than one-third the time it takes the usual QWERTY newcomer!

With all of its obvious advantages, one might expect the Dvorak keyboard to have swept the nation at once. But it didn't. The initial trouble faced by the Dvorak keyboard had as much to do with bad timing as anything else.

Dvorak developed his keyboard in the middle of America's Great Depression of the 1930's. As an efficiency expert, he saw that businesses needed typing, but couldn't afford to pay many typists. Dvorak proclaimed that a single competent typist using his system could do the work of at least two typists using QWERTY keyboards. As a model of office efficiency, this was a godsend. But to an American public that was already looking at astronomical unemployment figures, Dvorak's plan fell on deaf ears.

Not one to quit, Dvorak jumped on the bandwagon when Remington announced its new "silent" typewriter. The machine's silent efficiency drew the inventor. However, the public had no interest in silence while typing. Without the familiar clackity-clack of the keys, a typists had no way of knowing if any letters actually struck the paper. On top of this, people were simply accustomed to the standard QWERTY keyboard. Slow or fast, it felt like home. And the Dvorak arrangement fell into relative obscurity.

It wasn't until 1978 that the Dvorak system came to life again. At that time, a group of Oregon-based enthusiasts formed Dvorak International to promote use of the keyboard.

Headed by Virginia Russell, this company has reintroduced the Dvorak system into the workplace. Companies such as Bell Communications, Dupont, Aetna Institute for Corporate communication, and a handful of Fortune 500 companies make use of the Dvorak keyboard in many of their operations. It may be an uphill battle; over the years people have become wedded to QWERTY. But the popularity of the Dvorak keyboard is growing.

If you would like to learn the Dvorak method, Mavis Beacon is here to help. Once you select the Dvorak keyboard from your option menu, you'll

see the new arrangement on your screen, and your computer keyboard will automatically be set to the Dvorak arrangement.

For sources of accessories and software that will help you use the Dvorak method on your computer see the following list.

Dvorak International
31 Maple Street
Brandon, VT 05733
(802) 287-2343
Bibliography for
Dvorak articles from
1922 to present.
Over 200 entries (including
books). Dvorak Newsletter
also available at
$15 per year.

MACQWERTY
Paragon Concept
107 S. Cedros Avenue
Solana Beach, CA 92075
(619) 481-1477
Reconfigures the
Macintosh keyboard
to the Dvorak.

HOOLEON KEYBOARD
OVERLAYS
Hooleon Corporation
260 Justin Drive
Cottonwood, AZ 86326
(602) 634-7515
Dual marked overlays
for all computers in red
and black.

KEYTRONIC IBM
KEYBOARD
Keytronic
Box 14687
Spokane, WA 99214
(509) 928-8000
Keyboard for the IBM PC
and the first on the market
with Dvorak.

KEYTRONIC
Keytronic
Box 14528, MS-101
Spokane, WA 99214
(800) 262-6006 ext. 395
(509) 927-5395
Conversion kit for KB-5150,
KB-5151, KB-5151 AT.
Will work on Zenith 148
and 150.

Typing Errors

Typing Error Glossary

Mavis Beacon examines every keystroke you make. Using over thirty different typing "yardsticks," the program maintains a constant analysis of your typing errors. Among these are nineteen specific error categories. The following glossary explains the terms Mavis uses.

ACCURACY (POOR): Your typing accuracy is not improving as it should, or is actually decreasing. There can be several reasons for this condition. Mavis will make specific suggestions for your improvement.

BACKSPACING: The Backspace key, hit once, takes your cursor back one space over the last typed letter. Because backspacing requires a long reach from the home row. Mavis Beacon watches for errors caused by that hand motion.

DOUBLED: This error occurs when you type a single character twice. For example, you might mistype the word 'boat' as 'boot'.

DROPPED: A dropped letter error occurs when a letter in a word is left out, as when 'omit' is typed 'omt'.

FINGER: Major typing errors can be traced to the keys struck by a single finger. An example would be if you had a weak left ring finger and consequently had trouble typing the W, S, 2, and X keys. Mavis will help you address this problem with lessons that center on your weak fingers.

HAND: Much the same as FINGER, except that your typing errors can be traced to a weak hand. After noticing this problem, Mavis will have you concentrate on lessons designed to emphasize keys typed by your weak hand to strengthen it.

MIGRATION: A letter has shifted its position across two or more letters. An example would be if instead of typing 'that', you typed 'atht'.

MIRROR: A "mirror-image" typing error happens when you type a key in the correct row and column but with the wrong hand. That is you might type a letter in the third row, say E, with the third finger of your left hand. However, what you wanted to type was an I, with the same finger of your right hand. You have, in fact, typed a mirror-image of the letter.

MIS-HIT: This is a random typing error that isn't a transposition, omission ("dropped"), or overlap. You are typing with the correct hands and fingers, but your aim is often off-base. Finger and hand strength, typing position, and concentration are often causes of mis-hits.

NUMBER KEY: You aren't typing numbers correctly. Numbers are typed the same way letters are, but usually not as often. Numbers also require you to move further from the home row. If you are having difficulty typing numbers with the same speed and rhythm you already display when typing letters, Keys and Fingers can be a good place for you to practice until you bring your numbers up to speed.

OVERLAP: You accidentally typed two keys at once when you should have typed only one, usually by failing to hit the correct key squarely. This type of error often occurs when you are rushed and your sitting and hand positions are not correct. Concentrate on short, rhythmic keystrokes.

RECOVERY: The rate at which you recover your typing speed and accuracy (after you realize you've made an error) is too slow. You can deal with typing errors in one of two ways; either backspace and correct the mistake, or temporarily ignore the error and continue to type.

SHIFT KEY: You are typing uppercase letters where you should be typing lowercase ones, or you are substituting symbols for numbers. The problem is probably with your use of the shift keys. It's important to depress the shift keys in rhythm with the rest of your key typing.

SPEED (POOR): Your typing speed is not improving as it should or is actually decreasing. There are several reasons for this condition. Mavis will make specific suggestions for your improvement.

SUBSTITUTION: This error occurs when you type the wrong letter in place of the correct letter. When identified by Mavis, this error type is a random letter error, not specific to a hand or column. (See HAND, WRONG COLUMN, MIRROR).

SYMBOL KEY: You are typing symbols incorrectly. Symbols are keys other than letters and digits. Many symbols must be typed with the shift keys depressed. Others require you to stretch your hand slightly. Mavis will point out the specific problem and suggest the best remedy.

TRANSPOSITION: Occurs when you reverse two consecutive letters in a word, like typing 'the' as 'hte'. Transpositions also occur when you reverse a space position or a punctuation mark preceding or following a word, such as when you type 'a nant' instead of 'an ant'.

WRONG COLUMN: Occurs when you type a letter in the correct row, but in the wrong vertical column. For instance, if you typed an R, when you meant to type a T.

WRONG ROW: Occurs when you are typing with the correct fingers but are basing your typing in the wrong row. A frequent mistake of this type is typing F for R, or vice versa. The cure for this is usually to reposition your hands over the Home row.

However, there may be other problems that Mavis will point out, along with their appropriate remedies.

Now that you have a better understanding of the complex methods Mavis uses to tailor her lessons to your individual needs, we hope that you will enjoy the learning process even more, as... Mavis Beacon Teaches You Typing!

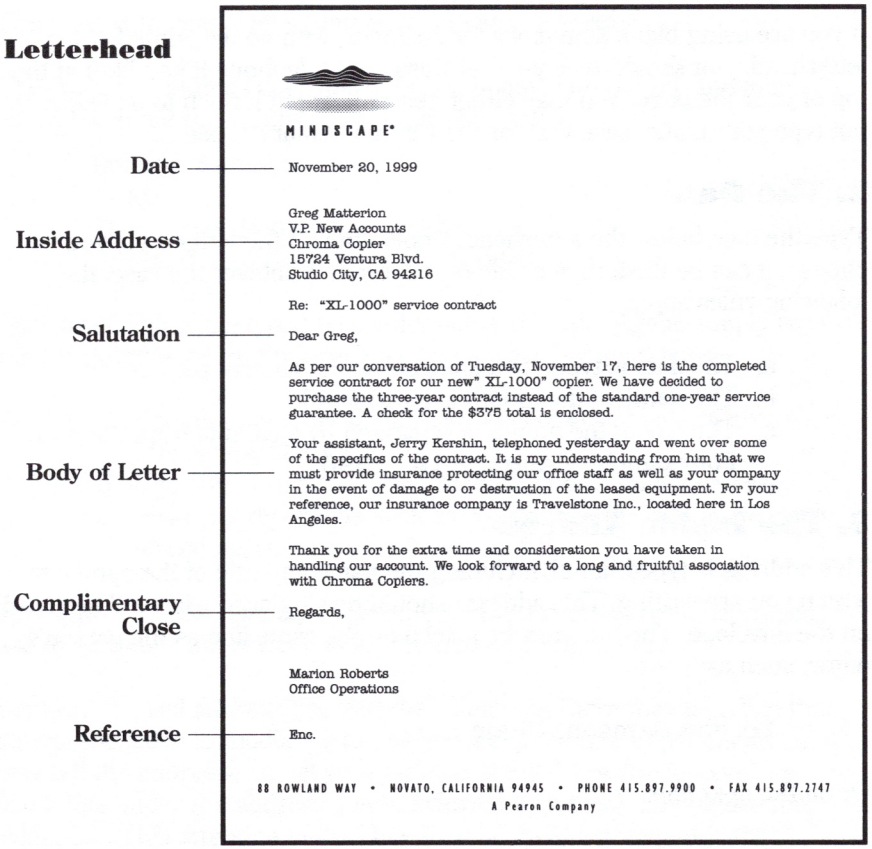
Typing Business Letters

In the days before computers, formal documents such as letters and reports demanded careful, painstaking typing and retyping before they were completed. The effort it took to prepare these documents was often greater than the energy initially required to compose them. Today, modern word processors routinely handle the most cumbersome, time-consuming typing chores, allowing you to concentrate on what you are trying to say. Thanks to your word processor, you no longer have to worry about such nagging tasks as "whiting-out" mistakes, centering lines, or making sure you have the proper margins. Many word processors will even correct spelling and punctuation errors!

No matter how good a writer you are, your reader's reaction is often swayed significantly by the way you present your material. Nothing kills a beautifully written piece faster than having so many lines to a page that the work is difficult to read.

It is important to present all written communication in a precise, attractive way to make the best impression possible on your reader. Certain standard forms for business letters, personal correspondence, and the like have developed over the years and Mavis Beacon would like to introduce them to you. Remember, a clear, concise presentation enhances what you have to say.

All formal letter formats contain the same basic elements. These are: the Letterhead or Originating Address (that is, your address), the Date, the Inside Address (the address of the recipient), the Salutation, the Body of the Letter, the Complimentary Close, and the Reference. The illustration below shows the position of each of these elements.


Letterhead
MINDSCAPE®
Date
November 20, 1999
Inside Address
Greg Matterion
V.P. New Accounts
Chroma Copier
15724 Ventura Blvd.
Studio City, CA 94216
Re: "XL-1000" service contract
Salutation
Dear Greg,
As per our conversation of Tuesday, November 17, here is the completed service contract for our new" XL-1000" copier. We have decided to purchase the three-year contract instead of the standard one-year service guarantee. A check for the $375 total is enclosed.
Body of Letter
Your assistant, Jerry Kershin, telephoned yesterday and went over some of the specifics of the contract. It is my understanding from him that we must provide insurance protecting our office staff as well as your company in the event of damage to or destruction of the leased equipment. For your reference, our insurance company is Travelstone Inc., located here in Los Angeles.
Thank you for the extra time and consideration you have taken in handling our account. We look forward to a long and fruitful association with Chroma Copiers.
Complimentary Close
Regards,
Marion Roberts
Office Operations
Reference
Enc.
88 ROWLAND WAY • NOVATO, CALIFORNIA 94945 • PHONE 415.897.9900 • FAX 415.897.2747
A Pearon Company

1. The Originating Address or Letterhead

Many people use preprinted letterhead stationary for both business and personal use. For business, your name, company address, and telephone number are usually included. For personal use, many people simply use their names, but your home address (and phone number if you like, although this is rarely included) may be added as well. This information is located at the top of your first page of stationery and usually takes up about two inches of space. The letterhead may be centered or flush right or left, depending on letter style (which we will discuss later).

If you are using blank stationery for business, with no preprinted letterhead, you should type your address (and telephone if you like) at the top of your the page. You may either center it or put it flush to one side. Do not type your name; save that for the Complimentary Close.

2. The Date

Type the date below the letterhead. Depending on the letter style you choose, it can be flush to one side or centered. Whatever the case, the following rules apply:

a. The date is typed two lines below the letterhead.
b. The name of the month is typed in full.
c. The day of the month is separated by a comma from the year. For example: `January 12, 1995`

3. The Inside Address

This address is typed in full, including the name and title of the person to whom you are writing. This address should be similar to what will be typed on the envelope. The title may be placed on the same line as the person's name, such as:

```
Lorena Samson, Chair
```

Or on the next line:

```
Lorena Samson
Chair
```

If the company address takes up more than two or three lines, you might want to put the title and name on the same line, just to keep the address

from taking up too much space. However, if Lorena's title were long, such as "Assistant Manager Product Storage, Retrieval and Development, Section II-IA," you might want to separate things out to keep the address neat:

```
Lorena Samson
Assistant Manager,
  Product Storage, Retrieval
  and Development, Section II-IA
```

The point is to keep everything clear and easy to read.

The company address goes under the company name. If it is too long, follow the same procedure as with the title:

```
Lorena Samson
Chair
The Great Midwestern, Atlantic
     and Pacific Insurance Cartel, Inc.
```

The street address is typed below the name and title. Again, simply type what is going to be on the envelope. Here are a few guidelines:

a. Use numbers for all buildings except **One** (as in "One Mindscape Plaza").
b. Use numbers for streets, avenues, and so on above **Ten.**
c. Write out directions such as **North**, **South**; abbreviate city directions such as **Northeast** as **NE.**

Type the city, state, and zip code beneath the street address. Learn and use the zip code abbreviations for the names of the states.

Between the last address line and the salutation, there may be a line that directs the letter immediately to one specific person or department. Or, it may tell the addressee what your letter is about. This line follows one blank line under the address and is followed by a blank line before the salutation, This attention or "re" line may be flush left, indented, or centered on the page. Here is an example of each:

Lorena Samson
Chair
Bank of America
6900 Melrose Ave.
Los Angeles, CA 90035

Re: Updated deposit procedure

Bank of America
6900 Melrose Ave.
Los Angeles, CA 90035

Attn: Accounts Receivable

4. The Salutation

If you know the person to whom you are writing, the salutation generally begins: "Dear...," and if you know the person well, you may of course use his or her first name. If you do not, you might put "Dear Mr. or Ms...," or perhaps a generic "Dear Sir or Madam," without mentioning a name at all. In any event, be graceful; do not assume any familiarity.

5. The Body of the Letter

Your letter should be typed single-spaced and organized into paragraphs. Depending on the style of your particular letter (we will discuss this later), the first line of each paragraph will either be indented five spaces or flush left. In any case, you should double space between paragraphs.

6. The Complimentary Close

The words you use to close your letter should reflect the impression you wish to leave with your reader. "Regards," "Very truly yours," and "Sincerely" are the usual endings, but you may choose some other closing with which you are more comfortable. Beware, though, that silly endings such as "Grudgingly yours" and the like rarely achieve the positive effect you may intend. When in doubt, stick to something a little more formal.

Following the closing, skip four lines and type your name, or the name of the person who has written, and thus will be signing, the letter.

7. The Reference

References are typed several lines down from the signature, depending on space available. They may tell the addressee who wrote and then who typed the letter. In this example Sam Bronson typed a letter for his employer, Lorena Samson:

LS:sb

References can indicate enclosures (attached pages) in a letter. Here are three ways of stating this enclosure:

Enc. Enc. (5) Enclosure

They can also designate who received copies of your letter:

c.c.: Jack Remme
Mary White

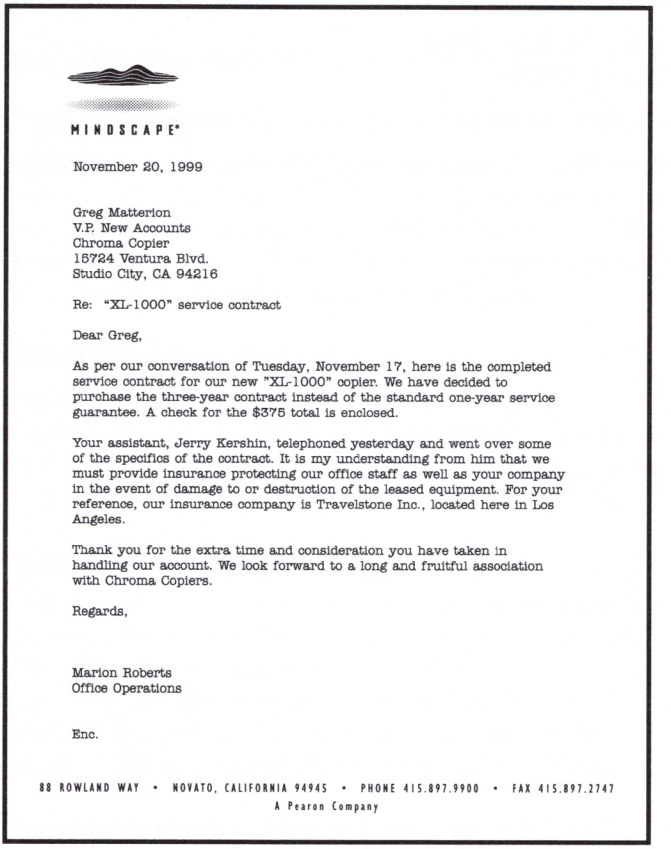
Postscripts may also be added in place of a reference.

P.S. Your immediate reply is urgently awaited, Lorena.

The Four Letter Forms

Most traditional business or personal letter styles can be broken down into two basic types: block and indented. Here are illustrations of the four most common forms:

Let's talk about the *full block style* (Figure 1) first. In this style, all elements, the Originating Address, Date, the Inside Address, Salutation, Body of the Letter, Complimentary Close, and Reference, are typed from the extreme left margin. The paragraphs are not indented. This type is the most formal of business approaches.



MINDSCAPE®

November 20, 1999

Greg Matterion
V.P. New Accounts
Chroma Copier
15724 Ventura Blvd.
Studio City, CA 94216

Re: "XL-1000" service contract

Dear Greg,

As per our conversation of Tuesday, November 17, here is the completed service contract for our new "XL-1000" copier. We have decided to purchase the three-year contract instead of the standard one-year service guarantee. A check for the $375 total is enclosed.

Your assistant, Jerry Kershin, telephoned yesterday and went over some of the specifics of the contract. It is my understanding from him that we must provide insurance protecting our office staff as well as your company in the event of damage to or destruction of the leased equipment. For your reference, our insurance company is Travelstone Inc., located here in Los Angeles.

Thank you for the extra time and consideration you have taken in handling our account. We look forward to a long and fruitful association with Chroma Copiers.

Regards,

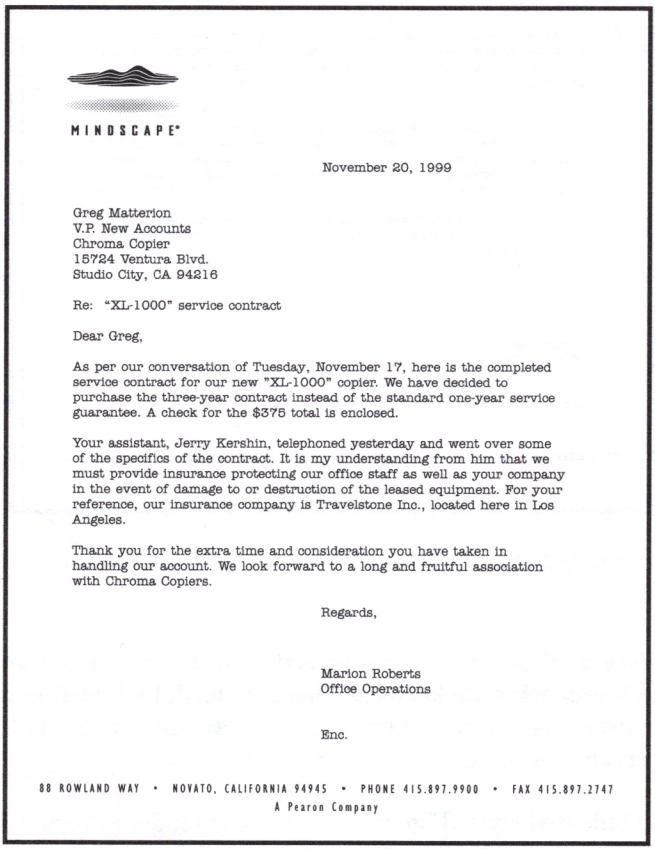
Marion Roberts
Office Operations

Enc.

88 ROWLAND WAY • NOVATO, CALIFORNIA 94945 • PHONE 415.897.9900 • FAX 415.897.2747
A Pearon Company

Figure 1. *Full block style*

The *standard block style* (Figure 2) continues with all elements flush to the left, with the exception of the Date, the Complimentary Close, and the Reference. These begin at the center of the page. This style, while not quite as rigid as the full block style, is still very formal.



MINDSCAPE®

November 20, 1999

Greg Matterion
V.P. New Accounts
Chroma Copier
15724 Ventura Blvd.
Studio City, CA 94216

Re: "XL-1000" service contract

Dear Greg,

As per our conversation of Tuesday, November 17, here is the completed service contract for our new "XL-1000" copier. We have decided to purchase the three-year contract instead of the standard one-year service guarantee. A check for the $375 total is enclosed.

Your assistant, Jerry Kershin, telephoned yesterday and went over some of the specifics of the contract. It is my understanding from him that we must provide insurance protecting our office staff as well as your company in the event of damage to or destruction of the leased equipment. For your reference, our insurance company is Travelstone Inc., located here in Los Angeles.

Thank you for the extra time and consideration you have taken in handling our account. We look forward to a long and fruitful association with Chroma Copiers.

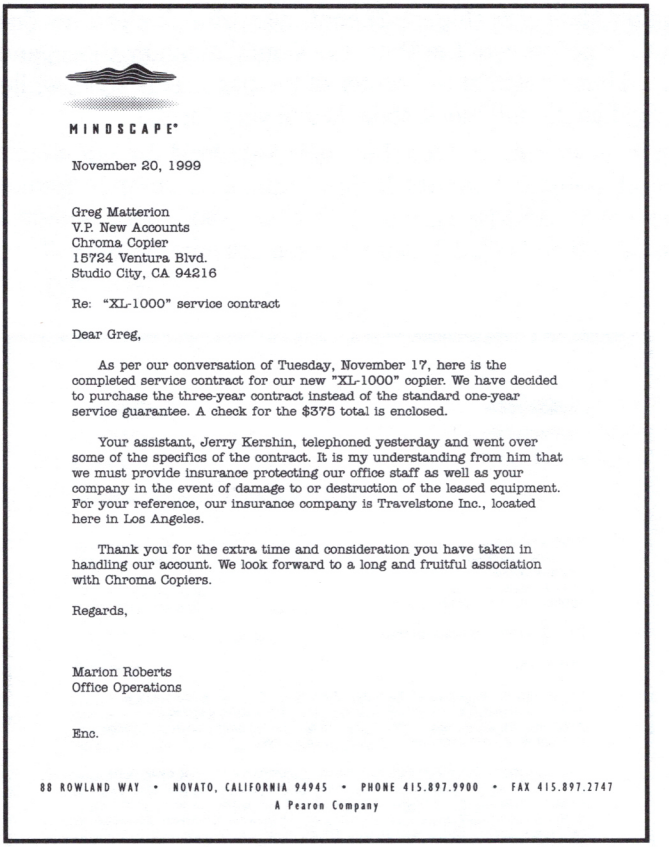
Regards,

Marion Roberts
Office Operations

Enc.

88 ROWLAND WAY • NOVATO, CALIFORNIA 94945 • PHONE 415.897.9900 • FAX 415.897.2747
A Pearon Company

Figure 2. *Standard block style*



MINDSCAPE®

November 20, 1999

Greg Matterion
V.P. New Accounts
Chroma Copier
15724 Ventura Blvd.
Studio City, CA 94216

Re: "XL-1000" service contract

Dear Greg,

As per our conversation of Tuesday, November 17, here is the completed service contract for our new "XL-1000" copier. We have decided to purchase the three-year contract instead of the standard one-year service guarantee. A check for the $375 total is enclosed.

Your assistant, Jerry Kershin, telephoned yesterday and went over some of the specifics of the contract. It is my understanding from him that we must provide insurance protecting our office staff as well as your company in the event of damage to or destruction of the leased equipment. For your reference, our insurance company is Travelstone Inc., located here in Los Angeles.

Thank you for the extra time and consideration you have taken in handling our account. We look forward to a long and fruitful association with Chroma Copiers.

Regards,

Marion Roberts
Office Operations

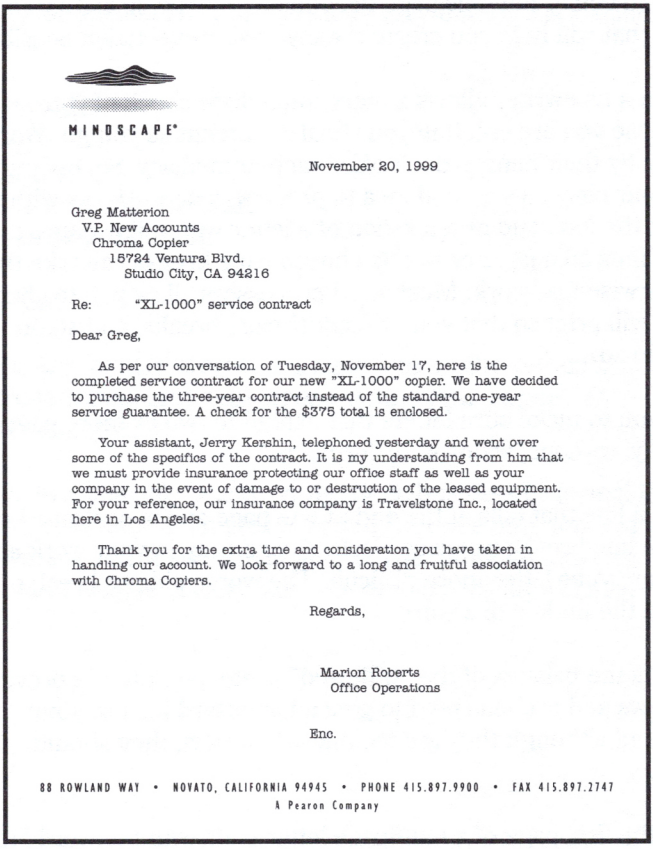
Enc.

88 ROWLAND WAY • NOVATO, CALIFORNIA 94945 • PHONE 415.897.9900 • FAX 415.897.2747
A Pearon Company

Figure 3. *Semiblock style*

The *semiblock style* (Figure 3) is perhaps the most common of these four styles. The semiblock style keeps all elements flush to the left except the first line of every paragraph, which it indents five spaces. The indentation is usually created by setting the Tab key to this spot.

Finally, the indented style (Figure 4) continues to indent the first lines of the main body paragraphs. This formula for business correspondence is probably the most stylized of the four and is the least often used. It is currently considered somewhat more difficult to read. However, styles



MINDSCAPE®

November 20, 1999

Greg Matterion
V.P. New Accounts
Chroma Copier
15724 Ventura Blvd.
Studio City, CA 94216

Re: "XL-1000" service contract

Dear Greg,

As per our conversation of Tuesday, November 17, here is the completed service contract for our new "XL-1000" copier. We have decided to purchase the three-year contract instead of the standard one-year service guarantee. A check for the $375 total is enclosed.

Your assistant, Jerry Kershin, telephoned yesterday and went over some of the specifics of the contract. It is my understanding from him that we must provide insurance protecting our office staff as well as your company in the event of damage to or destruction of the leased equipment. For your reference, our insurance company is Travelstone Inc., located here in Los Angeles.

Thank you for the extra time and consideration you have taken in handling our account. We look forward to a long and fruitful association with Chroma Copiers.

Regards,

Marion Roberts
Office Operations

Enc.

88 ROWLAND WAY • NOVATO, CALIFORNIA 94945 • PHONE 415.897.9900 • FAX 415.897.2747
A Pearon Company

Figure 4. *Indented style*

change with time, and so it is included here. The indented style indents the inside address at the left margin as well, with each subsequent line in this address also indented to the right of the one above:

Lorena Samson
Chair
6900 Melrose Ave.
Los Angeles, CA 90035

The signature line, too, is indented to the right of the Complimentary Close:

Very truly yours,

So far, we have spoken only about one-page letters. Often, however, you will be constructing multiple-page documents. Following are some general guidelines that will help you create the clearest presentation possible.

Working on a typewriter allows a more immediate check of your page setup because you are creating your final document as you go. Word processors, by their nature, don't offer such immediacy. So, before you print out your piece, it's a good idea to preview your work. As with a single-page letter, the look and organization of a letter with many pages is vital. Too many lines on a page or poorly chosen page breaks can take the edge off an otherwise fine work. Most word processors allow you to check how your piece will print so that you can adjust page breaks, and so on. Make it a habit to do so.

It is up to you to make sure letters that extend to two or more pages do so gracefully, without "widows" or "orphans."

A widow is a line that falls at the end of one page and is continued on the next. These line breaks can cause lack of continuity in your work and thus make reading your letter more difficult. The worst widows break off with a hyphen in the middle of a word.

An orphan is the balance of the "widowed" sentence from the previous page. Widows and orphans tend to give a haphazard look to your document and although they are technically correct, they should be avoided.

Generally, the first page of a multipage letter ends with the word "(more)." This is a courtesy to your reader. It also helps ensure that the balance of your letter will be read. Since you will be striving to end every page with a complete sentence, a reader might not realize that your letter continues. A simple "(more)" tells the reader that it does.

The following pages of your letter may or may not be numbered. Standard business procedure allows that a simple "Page 2", and so on, should go on the top left corner of the page. You might also add the name of your addressee and the date of your letter to identify the page in case it becomes separated from the first. The top margins of the subsequent pages of your letter can vary in size. Generally, they should start six lines

down from the top of the page. The body of the letter should then commence four lines below this. Styles do vary but here is a standard form:

[6 lines]

Page 2
Ms. Lorena Samson
January 1, 1995

[4 lines]

We are continuing to review the night deposit procedures and will present the full report at our meeting.

This section touches only briefly on the basic business or formal letter styles possible, and the examples provided here are only some of the possible formats. The fundamental idea is that, although letter styles may go in and out of fashion, a clear, uncluttered page layout will never let you down.

A History of Typewriting

Imagine it's 1828. The lamp wick sputters, and flickering images dance on the papers before you. Rubbing your cramped hand, you contemplate the twelfth letter of the evening. It's been three hours. The pen nib is getting worn, and the ink in the inkwell is begging to clot. You continue, because the letters must be written. But, oh, what you wouldn't give for someone to do your correspondence for you. Or something...

This was the situation for most everyone at the beginning of the nineteenth century. That is, until William Austin Burt, an inveterate tinkerer, came along. Tired of cramped hands and ink-stained pages, he created the first workable typewriter. It was a crude, wooden prototype, but it pointed toward a revolution in written communications, business organization, and education.

Amazingly, William Burt was unaware of the potential held by his latest invention. He was a quiet person whose only real love was the sea. To him, the writing machine was an interesting novelty, but he considered it far less useful than his automatic page turner. This boyhood invention was designed to let him read the sea stories he loved while making the roof shingles his father ordered. In fact, Burt might even have tossed his "typographer" aside had it not been for the vision of his friend, John P. Sheldon.

Sheldon saw dollar signs on every key.

On May 25, 1829, Sheldon, the founder and editor of the Michigan Gazette (which later became the *Detroit Free Press*) wrote a letter to President Andrew Jackson. Sheldon wrote praising the invention of young Burt:

> *Sir:*
>
> *This is a specimen of the printing done by me on Mr. Burt's typographer. You will observe some inaccuracies in the situation of the letters; these are owing to the imperfections of the machine, it having been made in the woods of Michigan where no proper tools could be obtained by the inventor...I am satisfied...that the rough machine (the typographer), with which I am now printing, will be ranked with the most novel, useful and pleasing inventions of this age.*

Burt's typographer was a heavy, box-like contraption, made almost entirely of wood. Like today's familiar toy typewriter, the typographer had type mounted on a metal wheel, with a rotating, semicircular frame. By turning a crank, Burt was able to move the wheel until it came to the letter he wanted. Then he would pull a lever, driving the type against the paper and making an inked impression.

The print was neat and legible, and with practice, Burt was able to increase his speed. There was only one drawback to all this. No matter how much he practiced, Burt was never able to make his machine type any faster that he could write with a pen.

That didn't stop Sheldon, a natural promoter, from seeing great things for the machine. He quickly got an exclusive patent for it in Burt's name. Burt, however, wanted nothing more than to take care of his personal and political duties. As the father of three active boys and a member of the Michigan Territorial Legislative Council, he had his hands full. Nevertheless, he now also found himself with the full and exclusive right "to make and vend to others his typographer." With Sheldon's encouragement, Burt started improving the machine for commercial release.

After about six months, he was able to unveil a new model. It had grown to the size and shape of a pinball machine. But the average pinball machine earns more in quarters in one day than Burt and Sheldon did during their entire venture. The public just wasn't buying. No one understood this crazy-looking contraption, much less the benefits of owning one. And, as far as how to operate it, everyone was lost. Burt and Sheldon were selling an improved typographer all right, but they didn't tell people how to use it. Or why anyone should learn. A torn page of a diary believed to be that of John P. Sheldon describes a never-implemented sales pitch:

> *If we might explain in detail that...by keystroking each letter in any particular word, leaving space between this and following words...and with some hour's practice of such daily any person will soon enable himself to imprint over 35 words per every minute...Such could increase business productivity.*

This is believed to be the first written piece of typewriting instruction. But selling the machine came first. How to use it would come later. Whatever the case, they hit the trail hard. They felt sure that someone

would recognize the potential of the typographer, instructions included or not. In a letter to his wife, Burt outlined his plans:

> *My Dear Companion—*
>
> *This is the first specimen I send you except a few lines I printed to regulate the machine. Next week I shall put my machine on sale and shall sell out the patent as soon as I can and return home.*

Unfortunately, Burt and Sheldon never found a buyer for their invention. They simply couldn't interest anyone in buying their patent. Burt finally returned home to the quiet life and his stories of the sea.

John Sheldon and William Burt may have failed to sell their early typewriter, but the idea certainly didn't die. People still had to grapple with the cumbersome, frustrating task of handwriting all correspondence. In 1853, experts at writing with a pen set the handwriting speed record at only 30 words per minute. And most people were hardly expert. With the advent of F.B. Morse's electric telegraph, things only got worse. Shorthand stenographers were in the same boat. Not only was speed a problem, but readability was getting thrown out the window.

Some form of personal writing machine, whatever its name or physical make-up seemed the only answer.

So, it's no surprise that the three decades after Burt's typographer were rife with typewriters–or at least machines that attempted typewriting. Some of these printed by lifting 20 pounds of machinery while the paper remained still. Others looked more like home permanent wave machines than typewriters. An interesting French example contained 70 type bars and was as difficult to play as a baby grand. Still other whimsical attempts resembled accordions or kitchen clocks.

There is one significant example among all these attempts, a typewriter designed by two English inventors, Alexander Bain and Thomas Wright. Bain and Wright put their heads together to solve the problem telegraph writers were having transcribing code as fast as it came off the wire.

What remains notable about their achievement is not that it solved the problem or worked with any noticeable ease, but that it introduced several ideas that advanced typewriter design. In Bain and Wright's machine, a cylindrical roller, or platen, rotated and advanced the paper every time the typist reached the end of a line. It was a simple, yet revolutionary, idea to let the paper move while the machine remained stationary.

Although these designs indeed contained elements of our modern typing machines, they were, as a group, fairly slow and clumsy. None saw its way past the experimental stage. Except for the invention of the 52nd person to attempt the feat, Christopher Latham Sholes.

His nightly tinkering with a duo of inventor friends, Carlos Glidden and S.W. Soule, led to the creation of a machine they called the Type-Writer in 1872. This machine was a workable, if somewhat bizarre looking rendition of what we think of as a typewriting machine. It's interesting, though, that the first machine finally produced was one geared to slow the typist down.

Sholes believed his machine was designed for convenience, but it had tremendous trouble with the keys jamming if they were hit too closely in succession. The primitive manufacture simply didn't allow each key hit to return to its mooring in time to make way for the next key chosen. Nothing Sholes or his friends did could eliminate the problem. Finally, in desperation, Sholes took a step that had a profound effect on you as a typist. Since he couldn't redesign the machine to work faster, Sholes redesigned the keyboard to force the typist to type more slowly. He perfected what is known as the "QWERTY" keyboard (after the first six letters of the typewriter's second row). After much experimentation, Sholes produced an arrangement of keys so inconvenient, so annoying and troublesome, that it could slow even an expert typist. But what helped solve Sholes' problem has left the rest of us in the soup. This keyboard, with a few minor changes, is used almost universally by English-typing people today!

Sholes shared a common bond with other early typewriter inventors. Few of them gave a second's thought to how to type on their contraptions. Sholes assumed two, or at the outside four, fingers were sufficient to operate his Type-Writer. He, among others, firmly believed that the third and fourth fingers of each hand were too weak to use. And Sholes assigned no specific keys to each finger. Exactly how to strike the keys was left to each typist's particular "style" and everyone looked at the keyboard while typing.

In fact, no real textbook was written for typewriting technique until 1880. Composed by Edward F. Underhill, the Handbook of Instruction for the Type-Writer was a thin 16 pages and opened left to right for "easier use at the typewriter." Few people opened it. Like Sholes, the public in general didn't want a set typewriting formula. The freestyle "hunt and peck" technique was considered the best way for everyone to create his or her own typing method.

That didn't stop the "hunt and peck" style from being the brunt of several jokes. Soon it came to be known as the "Columbus" or "Discovery" method. Sometimes it was even referred to as the "Biblical" ("Seek and ye shall find") approach. And though it may sound silly today, this two-finger method remained unchallenged for decades. But that didn't concern Sholes. His tragedy was that he lost every chance he had to capitalize on his invention. Shortsightedly, he sold the rights to his design to a bombastic smooth-talker by the name of James Densmore.

Densmore and his partner, suave, baby-faced George Washington Yost, wholeheartedly believed in the Type-Writer. Especially when they dreamed of the fortune they felt they could make from it. They tried to sell it to everyone, from the United States government on down. Finally, Philo Remington, president of his family's gun manufacturing company, listened. A contract was signed. One thousand Type-Writers were to be manufactured. Yost and Densmore were to sell the machines bearing the Remington name—wonderful news for our money-hungry duo, except that the Remington Type-Writer ended up looking a lot like a sewing machine.

Philo Remington believed in "art-in-work." And when he searched for an artist-mechanic to refine the Type-Writer for mass production, he hired the best he could find: William K. Jenne. Jenne had a spotless career in mechanics and considered Remington lucky to get him. Jenne was dedicated and proud of his expertise. However, Jenne's expertise was in the production of sewing machines. Nonetheless, Jenne dove right in.

The Remington Type-Writer ended up with a distinctive dressmaker design, complete with a foot pedal to advance the paper and sweet little flowers on the side.

Densmore and Yost may have pushed the design and manufacture of the Type-Writer along, but someone else ended up doing more to spread the word than the two of them put together: Mark Twain.

By the late 1870's, the Type-Writer was on the market, spotless and gleaming. But no one was buying. Not only did the machines cost an arm and a leg ($125, somewhat like buying an automobile today), but the concept of typewriting was still very new. Little or no advertising had been done.

At the point when it looked like typewriter sales would dwindle into non-existence, the machine (and Remington) got a lucky break. One sunny

afternoon, Mark Twain, already a famous newspaper columnist and writer, fell in love with the Type-Writer at a Boston department store that demonstrated how the machine worked. Each day a typist sat in a special corner of the store and produced samples on small slips of paper to hand out to customers.

A hungry sales clerk, eyeing Twain's interest, announced that the typist could type at the unheard of speed of 57 words a minute. "Impossible," said Twain. The sales clerk insisted and had the typist work while Twain timed the operator on his stop watch. Again and again, he timed. All afternoon the typist typed. When the operator finally typed faster than 57 words a minute, Twain bet the sales clerk that the typist couldn't do it again. Twain lost, but he ended the day one typewriter richer. Of course, his glee was somewhat diminished later that day when he noticed the details of the department store gimmick. In his autobiography, Twain explains what happened when he and a friend later returned to their hotel rooms.

> *We go out our slips and were a little disappointed to find that they all contained the same words...*
>
> *At home I played with the toy, repeating and repeating "The boy stood on the burning deck" until I could turn out that boy's adventure at the rate of twelve words a minute: then I resumed the pen for business, and only worked the machine to astonish inquisitive visitors. They carried off reams of the boy and his burning deck.*

Actually, Twain used the machine a great deal more than he let on. He composed the manuscript of *Tom Sawyer* on it, and even invented the standard, double-spaced, one-side-of-the-page-only manuscript that editors still expect today. When asked by the Remington Company, he contributed his personal testimonial to their sales catalog. It is typical, backhanded Twain:

> *Gentlemen: Please do not use my name in any way. Please do not even divulge the fact that I own a machine. I have entirely stopped using the Type-Writer, for the reason that I never could write a letter with it to anybody without receiving a request by return mail that I would not only describe the machine but state what progress I had made in the use of it, etc., etc. I don't like to write letters, and so I don't want people to know that I own this curiosity breeding little joker.*
>
> *Yours truly,*
> *Saml L. Clemens*

The public in general, however, was much slower than Mark Twain to understand the potential usefulness of the Type-Writer. All anyone seemed to want was one, or perhaps two, of the 25-cent typewritten samples of the type that originally hooked Mr. Clemens. And it wasn't until 1878 that the Remington picture brightened.

This year hailed the advent of an attractive but slightly odd publication called The Typewriter Magazine (the hyphen and capitalization of the W somehow getting dropped along the way), edited by William O. Wyckoff. The magazine, according to its masthead, was somewhat loftily "devoted to true reform, to the welfare of all mankind, and to advancement and improvement in all things." Quite an ambition for a lone person and a moderately circulated paper. However, Wyckoff fervently believed that the only true hope for the world's salvation was if everyone were to "forswear the use of pen and ink and take up typewriting."

Wyckoff insisted that the use of pen and ink created the evils of "pen paralysis, loss of sight, and curvature of the spine." He claimed that the typewriter could solve every modern problem. It could make one rich. The method was easy, wrote Wyckoff, "Purchase a Type-Writer and, having become expert, obtain a situation in some Law, Insurance, or Manufacturing or Merchant's office as a corresponding clerk or copyist." There, an enterprising typist could do "from three to twenty hours' work in one hour." Wyckoff proclaimed that such a well-equipped, dedicated worker could easily catch the eye of the boss and accelerate rapidly up the corporate ladder to "fame and fortune."

And if Frank E. McGurrin had his way, this dedicated worker, namely McGurrin, would type fast up the corporate ladder. And without looking at the keyboard. Since 1876, McGurrin had turned his dusty law clerk's office into a typewriting classroom. McGurrin found the venerable "hunt and peck" method far too slow for him to wade through his work. So, each night, McGurrin taught himself what he called his touch typing method. He boldly learned to operate the typewriter, using all of his fingers and without giving a glance at the keyboard. While McGurrin may not have realized Wyckoff's dream of a fast rise to "fame and fortune," he did manage a $2-a-week raise. And the touch typing system we still use today was born. Like most newborns, though, it had a problem getting up on its feet.

Since sales of the machine were so slow, no one cared how best to operate it. And stagnant sales had Densmore and Yost worried; their visions of wealth were slipping slowly away. They didn't know of McGurrin's feat, nor

would they have cared. They just wanted to unload the abominable machines. Their stepped-up sales force eventually sold the original Remington Type-Writing Co. to a company called Wyckoff, Seamans, and Benedict. And so editor Wyckoff found another focus for his "world vision." He became the head salesman for the newly restructured Remington Type-Writing Co.

But his and the company's mission was far from an easy one. People not only remained unimpressed by the work of the Type-Writer, but even resented the messages the machine produced. Most people believed that handwriting was the only appropriate method for personal correspondence. Some felt insulted, confused, or both when they received typed letters. They considered the use of type an insult to their ability to read longhand. For example, a Texas insurance man, J.P. Johns, sent a typed note to one of agents and received an indignant reply:

> *I do not think it was necessary then, nor will it be in the future, to have your letters to me taken to the printers and set up like a handbill. I will be able to read your handwriting, and am deeply chagrined to think that you thought such a course necessary.*

Others felt that the typewriter was by nature an invasion of privacy. They believed that no man was clever enough to work the machine without a machine operator's help and so even a love letter would have to be transcribed by an invading third party. To make matters worse, a typed petition to the Congress of the United States was loudly and publicly rejected. Under Congressional regulations of the time, only hand written or lithographed petitions could be submitted for consideration.

Wyckoff and his colleagues met these difficulties with patience. They believed in themselves. They believed in the typewriter. They knew if they persisted, their big break would come. When it did, they would be ready for it.

It came at the YWCA

Until 1881, shorthand stenography was booming in the business world, but no one yet realized the link between this skill and typewriting. The men who almost exclusively filled the stenographer positions in business didn't type, but readily admitted the time they did save by dictating their work to a typist. However, typewriting, colored largely by public opinion, was considered to have a dubious future. This, coupled with the low wage, the typist was offered (about $10 a week), made for few, if any, males clamoring for the job.

Enter the Young Women's Christian Association

The YWCA had a brazen idea: typing as a career opportunity for women. The general populace scoffed at the idea, but the business community embraced it, if only out of necessity. The eight young women who completed the first six-month typing course offered by the YWCA got jobs within days of graduation. Despite the opinion of some that the daily routine of the office would inevitably produce "severe nervous disorders" in the fragile female psyche, the women were successful. Soon, the YWCA found itself unable to train enough typists to meet the growing demand.

Remington immediately opened schools. Private schools were founded. And women found the chink in the armor of male-dominated business. Tens of thousands of women, eager to find a spot in the business world, were soon clamoring to learn to type.

But instruction on the typewriter was a haphazard affair, even at the schools. Although McGurrin had introduced touch typing some five years previously, that typing system was far from popular, and "hunt and peck" remained king. Typing instructors still taught each typist to use two or four fingers and assign them to whatever keys seemed best.

However, in 1882, Mrs. M.V. Longley began experimenting with what she called her "all-finger method" of typing. A pamphlet she composed that spring, challenged everyone who operated a typewriter to use all fingers on both hands. It was a shocking idea, but the success of students from Longley's Shorthand and Typewriting Institute made some typists take notice.

What really gave the all-finger technique the boost it needed, though, was the first typewriting contest.

Held in Cincinnati in the summer of 1888, the contest featured Frank McGurrin and Louis Traub, champion of the "four finger" typewriting method. And although on the surface the event only pitted the techniques of these two typists against each other, much more was at stake. The two different styles of typing, McGurrin with his touch strategy and Traub with his limited-finger, "view the keyboard" method, were at odds. The touch system won, hands down. The results were splashed only front pages of newspapers from coast to coast. Frank McGurrin won $500 and the world won a new popular typing method.

Subsequent typing contests, sponsored by touch typewriting converts including O.P. Judd, manager of the Remington office in Omaha, Nebraska, helped spread the word. The touch method began to sweep the country.

All this excitement about typewriting methods also lit a flame under the sales of the machines. Wyckoff, Seamans, and Benedict couldn't have been more thrilled. They had the great fortune to be selling the one and only typewriter on the market. Knowing that they must build on this incredible lead, Wyckoff and company tried everything they could to increase their company's size and output.

They started with what they considered a rather silly promotional stunt. They placed typists with Remingtons in the best hotels in the leading cities. They wanted to suggest that top-flight business executives were so hooked on typewriting that they needed a typist's services even while traveling. But, interestingly, what started out as mere publicity stunt quickly grew into a thriving business. Typewriters ended up in hotels from coast to coast.

While a great many typists used some variation of the touch method in their work, there was still no set formula for how to teach the system. McGurrin created the touch method. Longley taught the touch system and many business schools instructed what they believed to be touch typing. Each of these, however, contained widely different fingering techniques.

It wasn't until 1889 and Bates Torrey's Manual for Practical Typing that the touch system was even put to paper. But Torrey's fingering still wasn't consistent. (The r might be typed by one finger in one word and then by a different finger in another!)

The fingering taught today is due to the work of Cuspus Van Sant. This typing teacher and student of psychology understood that the mind works better when learning rules that are free from exceptions. One afternoon while fixing the clock in his typing classroom, Van Sant came upon the idea of assigning each key to a finger. To achieve this, though, he realized he would have to assign more than one key to some fingers. As the index fingers were considered the strongest, Van Sant gave each of these double duty. His text on typewriting was published three months later. We even base our modern fingering method on Van Sant's philosophy.

Typewriter sales continued to climb, especially with this constant flow of typewriting innovations. Wyckoff and Company were in the best position

possible. Not only did they manufacture the only typewriter in the country, they also owned the most workable typewriter patents. To meet the demand created by an increased typing community, Remington decided not only to increase production, but to work on the design. Designer Jenne and his co-worker, Jefferson M. Clough, took the famous flowers off their sewing-machine-inspired typewriter and added a "Shift Key," introducing, for the first time, lowercase letters to the typewriting phenomenon. Other, if minor, improvements were also added, but one major problem continued. Typists working the machine were still left in the dark, literally. They still couldn't see the line being typed.

This "blind typing" was due to the "back" or "down" strike method incorporated in all typewriters up to this point. The key would strike down onto the back of the paper, hiding the printed words from the typist's view. Several inventors tried to solve this problem, with varying degrees of success. Wyckoff's Remington Company felt itself too important even to address the problem. But in 1896 a young company by the name of Underwood solved it.

Underwood was to make Wyckoff and his Remington executives quake in their boots. They did it by using the invention of Franz Wagner, considered the greatest typewriter creator since Sholes. In 1899, he introduced what was to be the immensely popular Model 5. This model incorporated the problem-solving "up-strike" method of key-to-paper contact. Wagner's method allowed the keys to strike the sheet and then fall easily down into place. The typist had a perfectly clear view of what was just typed!

To further dull the Remington edge, the talented inventor team of the Smith brothers (no relation to the cough drop Smiths) formed a company dedicated to the "up-strike" principle. They believed so strongly in this innovation, that they plastered their feeling on signs and billboards all along the railroad tracks that ran past their factory. Perhaps this bit of advertising worked, but undoubtedly, those train travelers not familiar with the controversy ended up mightily confused by signs containing slogans like, "UP STRIKE ALL THE WAY!" and 'YOU ARE RIGHT SIDE UP; WHY WRITE UPSIDE DOWN?" with no further explanation.

Another innovator, Edward B. Hess, charged onto the scene. Known for his spontaneous bursts into operatic arias and Shakespearean prose, Hess was granted 140 patents during his lifetime. Hess' typewriting innovations, however, didn't have anywhere near the impact his personality did. In fact, his important idea for a fast, light keyboard would have died (along with

his company) had not the multimillionaire Thomas Fortune Ryan handed over a check for $220,000 in 1906. Thus, another major contender entered the typewriter arena: the Royal typewriter.

As typewriter mechanisms improved, so did methods for working the machine. There was still some controversy over the proper typing method, even though in 1901 a Remington Company survey revealed that over half the schools in America taught the touch system with the Van Sant fingering. Though the future seemed bright for this method, many teachers still remained somewhat hesitant to embrace this "all fingers, no sight" approach. Their reluctance was due as much to the typewriter companies as to the novelty of touch typing. These companies immediately recognized the sales angle of the touch system. They trumpeted the typewriter, with its "touch" approach, as the new time-saving device. Each company struggled to be the forerunner in "touch" innovations. Each sent any number of efficiency experts to hawk their company's machines and the touch method to teachers nationwide.

The only trouble was that virtually no one bothered to design a uniform training system for touch typing and Van Sant fingering. These "touch experts" created often conflicting answers to fingering and speed questions at the drop of a hat. So the typewriters were selling, the fingers were flying, but everyone was getting confused.

To make matters worse, the typing manuals that did exist added virtually no explanatory text. Torrey's manual of 1889, although considered innovative, never gained widespread popularity. The newer manuals contained page after page of letter and, sometimes, word drills. Learning consisted solely of copying letters off the page.

A number of these books included a compendium of actual business letters, but no instructions on how one might learn from the samples. Again students simply copied from the page. The teachers were no help. They were assigned to do little more than patrol classrooms while they corrected typing tests. Still, typing was on the rise. Business had recognized the need. Classrooms were full. And more and more typewriters were being produced.

Between 1905 and 1915, over one hundred separate typewriter manufacturing companies sprang up. Competition for sales was fierce. But the market was primed. The typewriter had come of age. It no longer had to prove its worth. Now it was merely a question of which brand to buy.

Sales representatives created new ways to entice office managers and company directors to buy. One way to increase sales was to contact an interested business and leave a typewriter as a "demonstrator" for a week. This policy introduced by Wyckoff's Remington Company, soon became an industry practice. In fact, most businesses had two or three typewriters "on approval" at any given time. It was an easy foot in the door for sales representatives. It also proved to be their biggest headache.

Leaving a demonstrator was indeed a way to get your company's name on the boss' mind when it came time for ordering. But it was also a way to have your typewriters severely damaged while "on approval," with no sale ever made.

Worse, thieves had a field day

Since competition for sales was fierce, typewriters were left at the drop of a hat. Credit and references were hastily checked, if at all. And thieves knew it. Unscrupulous characters would blow into town, set up a "business" and get several typewriters delivered on trial. By the time the sales representatives returned with hopes of closing a deal, the "business executives" had unloaded the goods and skipped town. Typewriter theft became so common that many detectives specialized in their retrieval.

All these goings on, however, didn't put a dent in the growth of the typewriter's popularity. By 1910, over two million typewriters had been sold in the United States.

In addition to office personnel, another group to embrace the typewriter was journalists. And while the sales representatives loved the journalists' reaction, they were soon frustrated when an old, battered machine in the city room became the sign of a star reporter.

Sales promotions offered little gifts with a purchase. Typewriter ribbons were packaged in reusable metal cases. By 1912, competition grew to such a frenzy that the typewriter community saw its first "fire engine chasers." These were sales representatives who literally chased after fire trucks. After all, clouds of smoke in the business district might mean big replacement orders for the charred, twisted remains of typewriters.

Now that the typewriter had become a fixture, people wanted more from it. They wanted speed. Typing contests had been used successfully to spread Frank McGurrin's touch typing. Now, contests were to be used as something else—public entertainment.

Soon the public began to take speed typing seriously. Like boxing or baseball, it became a national sport. Contests were staged regularly and with serious preparation. However, when it came to speed, not all companies were created equally. Not that the machines themselves were that different. Each had its particular characteristics, but these didn't make or break a contest.

Charles E. Smith did, however

The Underwood company could thank him for their unbroken string of speed-typing victories. Smith trained the Underwood stable of competition typists hard. They trained eight hours a day, five days a week. To Smith and those he trained, typing was a way of life. With success came national and often international acclaim. With failure, countless hours back at the keyboard.

The rules were strict. All the letters had to be perfectly centered in their spaces, there could be no more than 76 and no fewer than 61 letters to a line and no character could be darker than the others. On what were still clunky, manual Underwoods, these typists typed upwards of 140 words per minute. Eventually, though, Underwood's unbroken winning streak killed the very sport it helped create. The public grew tired of the monotony of typing contests that Underwood always won, and the national furor died down.

The excitement didn't die down for typewriting itself. With the advent of World War I and the desire for leaner, more efficiently run businesses, teaching typewriting was elevated to a kind of science. Still using the basics of Van Sant fingering, the best method for introducing key locations and finger reaches became a big source of controversy. Some advocated learning all the keys controlled by one finger before moving on to the next. This "first-finger-first" idea, as it came to be known, battled with the "skip around" method which advocated complete word drills, whatever the fingers involved. All in all, accuracy was stressed, and students were forced to type and retype practice pages until they were letter-perfect.

Blank keyboards came into vogue as another attempt to increase typists' speed and accuracy. Many companies also spent a pretty penny investing in typewriter keyboard "shields" to block the typists' view of the keys and so increase productivity in the office.

Business executives became so enthralled with typewriting that they took great pride in boasting about their secretaries' speed and accuracy.

If how to increase office productivity was a question of the day, dictation was, for many business executives, the answer. Executives discovered the speed and ease of dictating letters. They could talk as fast as they wished and correct as often as they liked without the effort of taking pen to paper. "Dictated but not signed" became the familiar ending to a business letter as a way for executives to look too busy to check their correspondence. "Dictated but not read" soon followed. Then, at perhaps the height of such executive freedom came "Dictated by transatlantic telephone and recorded on tape but not read and not signed."

Typewriting influenced other businesses as well. By 1915, the advent of typewriters caused more dictionaries to be published. Teachers noticed that spelling improved because incorrect spelling could no longer be blamed on poor penmanship!

Typewriting even flirted briefly with life as a detective. Because of the unique characteristics of individual typewriters (not unlike fingerprints), typewriters were used to identify criminals in several fictional and real-life criminal cases. In each case, the criminal(s) were narrowed down to those suspects who used a particular typewriter. Just think: a person's destiny might lie in the missing serif of the capital M on his or her typewriter.

With so much emphasis on speed and precision, it was inevitable that people would start taking a second look at the typewriter keyboard. The awkward machinery that initially caused our friend Sholes to make such a mess of his key placement was long gone. So, one would expect that a more efficient keyboard would replace it, right? Wrong! People had grown used to the QWERTY keyboard and were hard-put to accept any other.

A valiant soul by the name of August Dvorak tried his best, though. A confirmed efficiency expert, Dvorak examined the English language with the express purpose of putting letters next to each other on the keyboard that were also frequently found next to each other in words. His keyboard, not surprisingly called the Dvorak keyboard, increased accuracy in typing almost 50% and speed by 15% to 20%.

The effects of America's Depression and some ill-timed sales ventures contributed to the almost immediate demise of the Dvorak keyboard. These events, coupled with the familiarity people felt with QWERTY, simply stopped Dvorak in his tracks. It wasn't until well into this century that this system of key placement was reintroduced with some amount of success.

Dvorak's work did not result in the popularization of a new keyboard, but it did redouble the emphasis on accuracy in typewriting. However, accuracy was no longer to be strived for merely by copying typing drills from a textbook. Along with those of August Dvorak, other detailed studies in typewriting motion and efficiency were done.

Texts were created focusing on properly placed letter and word construction. People were stuck on the QWERTY keyboard and wanted rules to help them get the most from it. Instead of concentrating on speed alone, typing teachers began to try to understand how their students learned. Kinesthetics (that is, a concern for the "feel" of the typewriter keys, and how to reach them and return to the typewriter's second or "home row" effectively), were introduced as a means of increasing both speed and accuracy.

The teaching of typing had finally come of age. All of this activity spoke very well for the popularity of the typewriter. It was unquestionably fixed in the business world of America. But in 1930, few, if any, people could afford to buy new machines.

The Depression was taking its toll

With the stock market crash and subsequent failure of business after business, the survivors tightened their purchasing budgets. People held on to their typewriters longer or bought rebuilt machines to save on expense. Some sales representatives got so desperate that they were known to buy and destroy these refurbished machines just to create a market for their new models.

To make matters worse, after 1930, people got even pickier about the typewriters they did buy. Typewriters were no longer a luxury or a curiosity, they were a fact of everyday life. Typewriter sales representatives had to adjust their sales approach accordingly. As always in the history of commerce, the industry had to make a market. Now that the public was accustomed to the machine, the marketers had to be creative to lift the typewriter out of the sales doldrums. They found the hook; portability became the new "must have."

Every company came out with its own portable typewriter, down to the $5 "Pocket." The Royal Company released its portable line in a spectrum of over 500 color combinations. Even Cartier got into the act with a $1,150 24K, gold-plated typewriter. Royal went so far as to throw eleven thousand of its typewriters out of airplanes all across the country in an effort to

prove how sturdy they were. It worked! Royal stole the lead that Underwood had held for newly two decades.

The next real innovation came in 1933: the coupling of typing and electricity. This revolution was pioneered by the industrial giant, International Business Machines. Suddenly electric typing became the new status symbol and the power of IBM solidified. Throughout the ensuing years the craving for electricity as a means of increasing typing speed grew.

One thing remains necessary if we are to maximize the use we get from our computer systems. Just like Burt and Sholes, we need to master the keyboard, even if it is now a computer keyboard!

Interestingly enough, the development of computer keyboard instruction followed the same kind of path as instruction for the typewriter.

The first computer typing programs were just like the original typing manuals that appeared at the end of the last century. They tended to concentrate on simple letter and word drills. It was assumed that mere repetitious use of the keyboard would produce both speed and accuracy. Like the original cumbersome, tiring typewriting machines, the first computer typing programs were equally fatiguing—both to watch and manipulate. These programs made little, if any, attempt to analyze user typing errors.

Now, because of such pioneering work, we can bring you comfortable, yet challenging lessons that combine both speed and accuracy in teaching. With our use of artificial intelligence, typing errors can be analyzed and corrected instantly, before they become habits. Using the latest graphics technology, we can bring you clear, colorful, realistic images, superior to any ever created before. All of these advantages make *Mavis Beacon Teaches Typing* an adventure in fascinating, accelerated, fun-filled learning. So now, when you sit at your computer terminal to type and print out your writing in a matter of minutes, remember the frustration you'd have felt in 1828 with cramped hands, ink-stained pages and hours of writing to go...

And breath a sigh of relief.

Bibliography

Much research has gone into *Mavis Beacon Teaches Typing*. The following is a selected bibliography for the various portions of the program and manual.

The Theory of Typewriting/How People Learn/The Dvorak Keyboard

Ackerson, Luton, "A Correlational Analysis of Proficiency in Typing," Archives of Psychology, 13:1-73.

Angleo, John P., "A Comparative Study of the Highest and Lowest Ranking, First-Semester Typewriting Pupils," Thesis, Master of Arts, University of Pittsburgh, 1934, 58 pages.

Atwood, Dale D., "The Selection of Instructional Topics for Typewriting Methods Courses at the Undergraduate and Graduate Levels," Thesis, Master of Science, University of North Dakota, 1960, 143 pages.

Atz, Roger, "An Annotated Bibliography and Critical Review of Professional Literature Related to the Teaching of Typewriting, 1951-1956," Thesis, Master of Arts, State University of Iowa, 1958.

Bailey, Florence D., "Weighing of Speed and Accuracy Factors in Typewriting," Thesis, Master of Arts, State University of Iowa, 1930, 30 pages.

Banner, May Ruth, "A Study of the Relationship Between Letter-Production Test Rates and Straight-Copy Test Rates in High School Typewriting (Virginia)," Thesis, Master of Science, University of Tennessee, 1953.

Barnhart, Early W., "Reducing Typing Errors: A Five-Part Series," Business Education World, 363:22-23, October, 1955.

Barrineau, Patricia M., "An Analysis of Typewriting Errors Made by Students in a Second-Year Typewriting Class at Leon High School, Tallahassee, Florida," Thesis, Master of Science, Florida State University, 1954.

Barton, J.W., "Smaller vs. Larger Units in Learning to Typewrite," Journal of Educational Psychology, 12:465-474, November, 1921.

Beach, Martha Virginia, "An Intensive Course in the Fundamentals of Touch Typewriting," Thesis, Master of Education, University of Cincinnati, 1943, 151 pages.

Beardsley, Meta B., "The Relation of Typewriting Errors to Word Frequency," Thesis, Master of Science in Education, University of Southern California, 1942, 50 pages.

Biegel, R.A., "New Keyboards for Typewriters and Teleprinters," Conf. Int. Pscho. Tech., Prague, 222-225, 1935.

Blackstone, E.G., "An Experiment in Erasing in Typewriting," University of Iowa Research Studies in Commercial Education, No. 12, 8:158-166, 1932.

Book, William Frederic, "How Progress in Learning to Typewrite Should be Measured and Why," University of Iowa Monographs, No. 7, 62-76, 1926.

Bramesfeld, E., "An Investigation of the Striking of Keys on the Typewriter," Industrielle Psychotechnik, 6:224-230, 1929.

Brown, Jean Rosemond, "An Experimental Study to Compare the Relative Merits of Two Methods of Teaching Typewriting," Thesis, Master of Science, University of Michigan, 1940, 155 pages.

Cleary, Joseph B., "A Typing Experiment," Journal of Business Education, 31:29-31, October, 1955.

Cooper, William E., ed., Cognitive Aspects of Skilled Typewriting, Springer-Verlag, New York, 1983, 417 pages.

Davidson, Sidney H., "A Study of the Effects of Rest Periods on Progress in Learning in Typewriting," Thesis, Master of Arts in Education, University of Southern California, 1929, 50 pages.

Davis, Dwight D.W., "An Analysis of Student Errors on the Universal and the Dvorak-Dealey Simplified Typewriter Keyboard," Thesis, Master of Arts, University of Washington, 1935, 77 pages.

Desoe, Lillian Rushmeyer, "An Experimental Study of the Integration of Shorthand and Typewriting Instruction in One Course, Transcription," Thesis, Master of Science in Education, Cornell University, 1943, 88 pages.

DuFrain, Viola, "Typewriting Teachers and Time-and-Motion Studies," National Business Education Quarterly, 12:15-20, 50, 66, December, 1943.

Dvorak, August, Merrick, Nellie L., Dealey, William L., & Ford, Gertrude Catherine, Typewriting Behavior, American Book Company, New York, 1936, 521 pages.

Goodwin, Lucile, "A Fusion Course in Typewriting," Thesis, Master of Arts, Southwest Texas State Teachers College, 1941, 128 pages.

Griffith, Cletus Leon, "A Study of Air Condition in Schoolrooms and Its Relation to Efficiency in Typewriting," Thesis, Master of Science, Purdue University, 1935, 44 pages.

Herdman, Virginia, "Learning to Typewrite by Self-Instruction," Thesis, Master of Education, University of Cincinnati, 1953.

Kizer, Marguerite, "The Effect of Piano Playing on Learning to Typewrite," Thesis, Masters, State University of Iowa, 1926.

Marshall, Nancy D., "An Experiment in Teaching Typewriting According to the Proposals of Mrs. Mabel Mize," Thesis, Master of Arts, University of Kansas, 1941, 58 pages.

Thompson, Mildred, "A Study of the Effect of Hunt-and-Peck Habits on Typing Achievement," Thesis, Master of Arts, Colorado State College of Education, 1944, 94 pages.

The History of Typewriting/Portions of History of the Dvorak Keyboard

Blanchard, Jr., Carroll H., The Early Word Processors and Word Processing: Keyboards, Kinesthesis & Women, Educators: Project IV, 1981, Lake George, New York.

Bliven, Jr., Bruce, The Wonderful Writing Machine, Royal Typewriter Co., Inc., New York.

Clem, Jane E., Techniques of Teaching Typewriting, McGraw-Hill Book Co., Inc., 1955, New York.

Russon, Allien R., and Wanous, S.J., Philosophy and Psychology of Teaching Typewriting, South Western Publiching C., 1960, Cincinnati, Ohio.

MINDSCAPE, INC.
88 ROWLAND WAY
NOVATO, CALIFORNIA 94945
415/897-9900

2204610-200001/185Y